

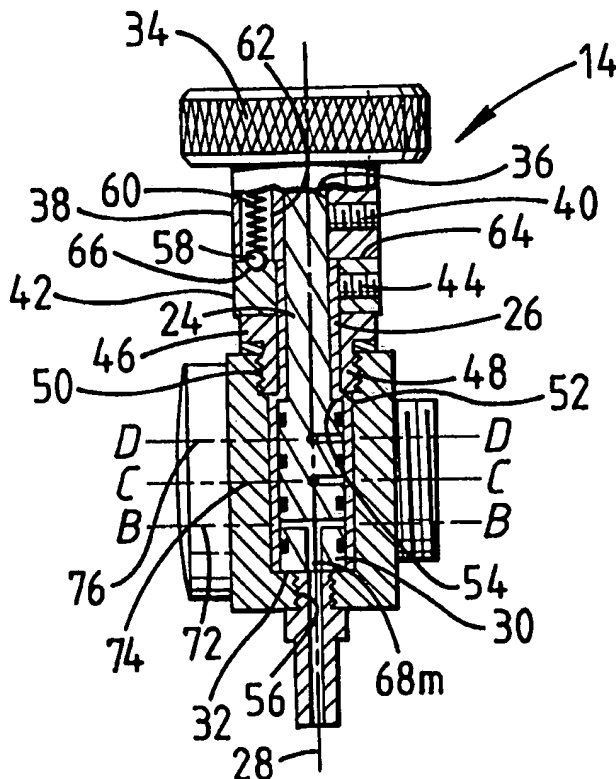


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(21) International Application Number: PCT/GB98/00148 (22) International Filing Date: 16 January 1998 (16.01.98) (30) Priority Data: 9700842.9 16 January 1997 (16.01.97) GB (71) Applicant (for all designated States except US): FREELAND SERVICES LIMITED [GB/GB]; National House, Santon, Isle of Man (GB). (72) Inventor; and (75) Inventor/Applicant (for US only): MORRIS-WATSON, Michael, Edward [GB/GB]; 12 Bedford Road, Holland-on-Sea, Essex CO15 5OH (GB). (74) Agents: STEBBING, Peter, John, Hunter et al.; Ablett & Stebbing, 45 Lancaster Mews, Lancaster Gate, London W2 3QQ (GB).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>

(54) Title: DEVICE FOR DISPENSING LIQUID AND ICED CONFECTIONERY**(57) Abstract**

A device is disclosed which is capable of simultaneously dispensing liquid and iced confectionery. A valve arrangement (14) is coupled to a supply of the iced confectionery and to one or more sources of the liquid confectionery such as flavouring syrup. The valve arrangement comprises shaft (24) and sleeve (26) components capable of relative rotation under manual operation to selectively adopt any of a number of dispensing locations, at each of which the liquid confectionery is added to the iced confectionery at the point of dispensing. Where plural flavours of the liquid confectionery are available, the valve arrangement preferably is capable of dispensing the flavours individually or in various combinations, depending on the dispensing location selected. The valve arrangement can also adopt one or more positions at which no liquid confectionery is dispensed.



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DEVICE FOR DISPENSING LIQUID AND ICED CONFECTIONERY

This invention relates to a device for dispensing liquid and
5 iced confectionery and in particular for dispensing liquid
syrup and ice cream confectionery.

Ice cream is often served in an aerated form from a pump
dispenser connected to a tank containing a chilled and aerated
10 ice cream mixture. The consistency of aerated ice cream is
such that it flows quite readily and for this reason it can
be continuously dispensed through different shaped exit
apertures to give a decorative effect. It is common practice
to add liquid confectionery in the form of syrup to the
15 surface of the aerated ice cream once it has been dispensed.
Various syrups can be used to flavour the ice cream as
desired. This can make the ice cream more interesting and
appealing to individual tastes.

20 There are a number of disadvantages associated with this
approach. Firstly the syrup is applied randomly leading to
different concentrations over the surface of the ice cream.
Secondly in situations where the aerated ice cream has been
dispensed onto a cone there is a risk that the liquid syrup
25 will drip from the surface of the ice cream and on to the hand
of the person holding the cone. Thirdly the time taken to
manually apply the syrup to the ice cream once it has been
dispensed is often significant during busy vending periods.

30 An object of the present invention is therefore to overcome
the above drawbacks.

According to the invention there is provided a device for
dispensing liquid and iced confectionery comprising, an outlet
35 for connection to an iced confectionery supply means and a
selectively operable valve means for connection to at least
one liquid confectionery supply means, said outlet being

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connected to said valve means so that liquid and iced confectionery may be dispensed simultaneously therefrom.

This allows the liquid confectionery to be dispensed in a controlled manner over the surface of the iced confectionery. The liquid confectionery is dispensed in a more consistent manner leading to less waste and time between servings.

Preferably, said valve means is adapted to be connected to a plurality of said liquid confectionery supply means for receiving different liquid confectionery supplies therefrom. This allows more than one flavour of liquid confectionery to be dispensed with the iced confectionery.

Preferably, said valve means comprises a plurality of operational settings, each corresponding to a different liquid confectionery selection to be dispensed. In this way it is possible to select one or more different flavours of liquid confectionery.

20

Preferably, said valve means comprises a first valve member movable between a plurality of pre-determined positions each corresponding to an operational setting of the valve means, and a second valve member movable between an open and a closed position for dispensing the selected liquid confectionery to said outlet. This allows different flavours to be selected before the iced confection is dispensed.

Preferably, the first valve member is provided with engagement means for engagement with the second valve member at each of said pre-determined positions. By this means, only the selected flavour of flavours is dispensed with the iced confection.

Preferably, said valve means further comprises a valve inlet and a valve outlet for each liquid confectionery supply, and said first valve member is adapted to obturate at least one

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of said valve inlet or outlets at each of said pre-determined positions. If this is done, not all of the available flavours need to be dispensed with the iced confection.

- 5 Preferably, said first and second valve members are rotatably mounted within a valve housing, providing a compact valve.

Preferably, said second valve member comprises a rotatable sleeve having an inlet and outlet aperture for each liquid
10 confectionery supply, the inlet and outlet apertures being arranged to align annularly with corresponding valve inlet and outlets in said open position only.

In this respect the liquid confection is only dispensed when
15 the valve is opened.

Preferably, said first valve member comprises a cylindrical end portion rotatably mounted within said sleeve, the cylindrical end portion having a plurality of internal
20 passages for each liquid confectionery supply, each passage being arranged to align annularly with a corresponding sleeve inlet or outlet aperture in at least one of said pre-determined positions.

- 25 This further provides for a compact valve arrangement.

Preferably, said first and second valve means are manually operable.

- 30 In this respect the flavours may be selected manually between each delivery of iced confectionery.

Preferably, said outlet is in the form of a nozzle having a plurality of internal passages which connect to said valve
35 means for receiving liquid confectionery therefrom.

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This allows the liquid confectionery to pass directly to the outlet of the device.

Conveniently, said nozzle comprises a central aperture having
5 an entry for receiving iced confectionery and an exit for
dispensing iced confectionery, and wherein said internal
nozzle passages terminate at the periphery of said nozzle exit
so that liquid confectionery may be dispensed on the surface
of said iced confectionery. This provides for controlled
10 application of the liquid confectionery to the surface of the
iced confectionery.

Conveniently, said valve means is adapted to be connected to
a dispensing arm of said iced confectionery supply. In this
15 way it is possible to synchronise the dispensing of the iced
confectionery with the liquid confectionery.

The invention will now be described by way of example only
with reference to the following drawings, in which:-

20

Figure 1 is a plan view of the device of the present
invention;

Figure 2 is a section view of the device of Figure 1 along
25 lines A-A;

Figures 3A to 3C are cross-section views of one element of a
valve included in the device along lines B-B, C-C and D-D in
Figure 2 respectively;

30

Figures 4A to 4C are similar cross-section views of a further
valve element also along lines B-B, C-C and D-D in Figure 2;

Figures 5A to 5C are section views with most of the valve
35 detail removed along lines B-B, C-C and D-D in Figure 2;

Figure 6 is a section view taken along lines C-C in Figure 2;

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Figures 7A, 7B and 7C, and Figures 8A, 8B and 8C are similar to Figures 3A, 3B and 3C and Figures 4A, 4B and 4C respectively, and are used to illustrate an alternative form if the invention capable of simultaneously dispensing three
5 flavourings in combination.

With reference to Figure 1 there is shown a device (10) for simultaneously dispensing liquid and iced confectionery in the form of flavoured syrup and aerated ice cream. A device 10
10 is adapted to be connected to the end of an ice cream pump dispenser (not shown) for receiving an ice cream supply therefrom. The device comprises a housing (12) for a selectively operable valve assembly (14) and two external connections (16a/16b) connected to separate supply cylinders
15 (not shown) each containing a different flavoured syrup. A nozzle (18) having a star-shaped exit is located in an aperture (20) in the housing (12). The valve assembly (14) includes an operating lever (22) and connection to the operating lever (not shown) of the ice cream pump dispenser.

20

Referring now to Figure 2 which shows the valve assembly (14) in greater detail. The valve assembly (14) comprises a first valve member in the form of a rotatable shaft (24) and a second valve member in the form of an annular sleeve (26) co-
25 axially disposed around the shaft (24) about a valve axis (28). The shaft (24) and the sleeve (26) are located in a bore (30) formed in the housing (12). At one end the shaft (24) and sleeve (26) abut a base surface (32) of the bore (30) and at the other extend out of the bore towards a selector
30 control knob (34). At this end the shaft (24) extends out of the sleeve (26) and into a bore (36) formed in a reduced diameter portion (38) of the selector control knob (34). The shaft (24) is fixed relative to the selector control knob (34) by means of a radial grub screw (40) disposed in the reduced
35 diameter portion (38), and thus rotates with the knob 34. A collar (42) positioned axially adjacent the reduced diameter portion (38) of the selector control knob (34) is similarly

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fixed to the sleeve (26) by means of a radial grub screw (44). The shaft (24) and sleeve (26) are retained within the housing by means of a lock-nut (46) having a reduced diameter externally threaded portion (48) which engages a
5 correspondingly enlarged diameter internal threaded portion (50) at the opening to the bore (30). The lock-nut (46) engages a shoulder (52) on the sleeve (26) and this engages a corresponding shoulder (54) on the shaft (24). The base of the bore (32) includes an aperture (56) and the connection
10 (16b) to one of the liquid confectionery supply cylinders is located in the aperture (56).

The reduced diameter portion (38) of the selector knob (34) is provided with means for selectively locking it to the
15 collar (42) at each of a number of predetermined angular positions. A ball-bearing (58) is located at one end of a compression spring (60) located in an axially extending bore (62) in the reduced diameter portion (38). The spring (60) urges the ball-bearing (58) axially towards an adjacent
20 engagement surface (64) of the collar (42). The engagement surface (64) includes eight circumferentially spaced part spherical engagement recesses (66) for engagement with the ball-bearing (58). The engagement recesses (66) are equally spaced around the engagement surface (64) of the collar (42)
25 and the centres of adjacent recesses (66) are thus angularly separated by 45 degrees.

With reference now also to Figure 3, the shaft (24) is provided in this example with twelve radially extending
30 internal passages (68a-1), various of which are located, as will be described, at each of three axial locations along the shaft. An axial passage (68m) extends axially part way along the shaft (24) from the aperture (56), where it communicates with the connection (16b), to a first (72) of the
35 aforementioned axial locations. As is best seen with reference to Figure 3a, at this location the central internal passage (68m) is connected to three radial passages (68a-c)

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which extend to the surface of the shaft (24). At this axial location, the internal passages (68a and 68c) are diametrically opposed and the internal passage (68b) has an angular offset of 45° to internal passage (68a). It will be appreciated that the angular positions of the radial passages (68a-c) and, indeed, of the other radial passages (68d-l) now to be described are designed to have a desired operational relationship with selected predetermined angular positions in which the knob 34 and shaft 24 can be locked to the collar 42.

10

Further along the shaft (24), at a second axial location (74), the shaft (24) is provided with five radially extending internal passages (68d-h). At this location, as best seen in Figure 3b, there is an angular offset of 135° between the internal radial passages (68d and 68e), an offset of 45° between internal passages (68e and 68f), an offset of 90° between internal passages (68f and 68g) and an angular offset of 45° between internal passages (68g and 68h) and also (68h and 68d).

20

In relation to the angular positions of the internal passages (68a-c) at the first axial location (72) the internal passage (68d) has an angular offset of 45° relative to the internal passage (68a) in a direction of rotation opposite to that of the offset between internal passages (68a and 68b).

At a third axial location (76), and as shown in Figure 3c, there are four radially extending internal passages (68i-l). The internal passage (68i) has the same angular disposition as the internal passage (68d). Similarly the internal passage (68j) has the same angular disposition as internal passage (68e) and the internal passage (68l) has the same angular disposition as the internal passage (68g). The internal passage (68k) is offset by 90° from the internal passage (68j) and by 45° from the internal passage (68l).

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Referring now to Figures 4a to 4c the sleeve 26 includes a plurality of apertures (78a-e) distributed about its circumference at various of the corresponding axial locations (72, 74 & 76). At the first axial location (72) there is only one aperture (78a). At the second axial location (74) there are two apertures (78b and 78c). The aperture (78b) is offset in one direction from the aperture (78a) by 45° and in the other direction from the aperture (78c) by 135° . At the third axial location there are two apertures (78d and 78e). The aperture (78d) has an angular offset of 45° from the aperture (78b) and an angular offset of 90° from the aperture (78c). The aperture (78e) has an angular offset of 135° from the aperture (78d) and 45° from the aperture (78c).

Referring now to Figures 5a to 5c the valve housing (12) includes a plurality of internal passages (80a-e) which are connected to the bore (30) at various of the corresponding axial locations (72, 74 & 76). At the first axial location (72) an internal passage (80a) extends from the bore (30) at a position (82) to the internal surface of the aperture (20) at a position (84). At the second axial location (74) there are two internal passages (80b and 80c). The first of these (80b) extends from the bore at a position (86) and extends to the surface of the aperture (20) at a position (88). The second internal passage (80c) extends from the bore (30) at a position (90) to a further internal passage (92) which extends parallel to the bore (30) to the external connection (16b). At the third axial location (76) there are two internal passages (80d and 80e). The internal passage (80d) extends from the bore (30) at a position (94) to the aperture (20) at a position (96). The internal passage (80e) extends radially outwards from the bore (30) at a position (98) and is connected to a further internal passage (100), which extends parallel to the bore (30), by an additional internal passage (102) perpendicular to both the internal passage (80e) and the internal passage (100). The relative angular spacings of the internal passages with respect to the bore (30)

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correspond to the angular spacings of the apertures (78a-78e) in the sleeve (26) respectively.

Referring now to Figure 6 the nozzle (18) is generally
5 cylindrical and includes a nozzle entry (104) at one end and
a nozzle exit (106) at an opposite end thereof. The nozzle
has an outer surface (108) which is provided with three
annular axially spaced grooves (110, 112 & 114). A fourth
annular groove (116) is provided on the outer surface (108)
10 between the annular groove (114) and the nozzle entry (104)
and has a sealing ring (118) disposed therein. A series of
internal passages (120a-120c) extend within the nozzle,
respectively between the nozzle exit (106) and the annular
grooves (110, 112 & 114). The internal passages (120a-120c)
15 terminate at respective points on the star nozzle exit. The
annular grooves (110, 112 & 114) are spaced such that they
correspond to axial positions (84, 88 & 96) within the
aperture (20). By this means, the internal passages (80a, 80b
and 80d) are connected directly to the internal passages
20 (120a-120c) respectively.

In use, when it is desired to dispense ice cream with syrup,
a selection is first made of the flavoured syrup or
combination of syrups that are to be dispensed. This is done
25 by manually rotating the selector knob (34) relative to the
collar (42). The selector knob (34) is moved to one of eight
predetermined settings corresponding to one of its eight
possible angular positions relative to the collar (42). At
each of these positions the ball-bearing (58) engages one of
30 the part-spherical recesses (66) in the collar engagement
surface (64). When engaged, the ball-bearing temporarily
locks the selector knob (34) to the collar (42) and resists
further relative rotational movement until the knob 34 is
turned to a new setting. In three of these angular positions
35 one of the internal passages (68a/68b/68c) is angularly
aligned with the aperture (78a) at the first axial location
(72) and a connection is thereby provided between the aperture

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(78a) and the supply cylinder connected to connection (16b). In a similar sense at three angular positions one of the internal passages (68d-68h) is aligned with the aperture (78b) whilst a further one of the passages (68d-h) is aligned with the aperture (78c). In these three positions, a connection is provided between the aperture (78b) and the supply cylinder connected to the connection (16a). In a like manner in three of the eight angular positions one of the internal passages (68i-68l) is aligned with the aperture (78d) whilst one of the other internal passages (68i-68l) is aligned with the aperture (78e). In each of these positions the aperture (78d) is thus connected to a further one of the external connectors.

Because of the spacing of the angular positions of the internal passages (68a-68l) it is possible to select just one of the flavoured syrups or a combination of syrups by moving the selector knob (34) between the predetermined settings. It is also possible to select none of the flavoured syrups. In the example described, this occurs at two of the eight angular positions.

In the particular example thus far described, and assuming that three flavours of syrup, denoted A, B and C respectively, are available for connection to the device 10, the arrangement is such that, associating the three flavours A, B and C with the distribution components disposed at locations 72, 74 and 76 respectively, the following flavours or combinations of flavour are dispensed at the following angular positions of the shaft 24 relative to that shown in Figure 3:

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	0 degrees	Flavours A and B
	45 degrees	Flavours A and C
	90 degrees	Off (No syrup dispensed)
5	135 degrees	Flavour B
	180 degrees	Flavour C
	225 degrees	Flavour A
	270 degrees	Off (No syrup dispensed)
	315 degrees	Flavours B and C

10

Once the selection has been made, the flavoured syrup can be dispensed. This is done by rotating the valve assembly (14) within the housing (12) by movement of the lever (22). The shaft (24) and sleeve (26) are caused to rotate in unison about the valve axis (28) to an angular position in which the apertures (78a-78e) align with the internal passages (80a-80e) respectively. In this position a connection is made between the internal passages (120a-120c) at the nozzle exit (106) and the external containers containing the flavoured syrup.

20

The syrup is thus dispensed simultaneously at the nozzle exit (106) with the ice cream which passes through the nozzle entry (104).

25 It will be appreciated that the arrangement described herein is by no means the only one that can be used to dispense selected flavours. In particular, where three syrup flavours are available, it may be desired to dispense all three flavours at once, which cannot be done with the above-
30 described arrangement.

The modification to the number and disposition of the radial passages in the shaft (24) shown in Figures 7a, 7b and 7c and to the positioning of the apertures in the sleeve (26) shown
35 in Figures 8a, 8b and 8c can be used, with appropriate realignment of fixed internal passages, to advantageously

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replace one of the two "off" positions in the above-described arrangement with a position at which all three syrups can be dispensed.

- 5 In Figures 7 and 8, the reference numbers for the shaft (24) and the sleeve (26) are retained unchanged, but those for the passages in the shaft are increased by 100, to 168a-n, and those for the apertures in sleeve (26) are also increased by 100, to 178a-e. Referring now to these drawings, it will be
10 seen that, with regard to the apertures in the sleeve (26), only one of these is changed from the Figure 4 arrangement; this being that shown in Figure 8b, where the aperture (178c) has been moved through 90 degrees.
- 15 The arrangement of the axial passages (168a-n) on the other hand differs quite substantially from that of the passages (68a-l). As can be seen from Figure 7, in which only the centre lines of the passages are shown for clarity, the configuration of passages (168e-i) is the same as that of
20 passages (168k-n) but rotated through 90 degrees therefrom.

Using the configuration of Figures 7 and 8 and the same nomenclature as before, this gives the following:

25	0 degrees	Flavour C
	45 degrees	Off (No syrup dispensed)
	90 degrees	Flavours A, B and C
	135 degrees	Flavours A and C
	180 degrees	Flavours A and B
30	225 degrees	Flavours B and C
	270 degrees	Flavour A
	315 degrees	Flavour B

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CLAIMS:

1. A device for dispensing liquid and iced confectionery
5 comprising, an outlet for connection to an iced confectionery
supply means and a selectively operable valve means for
connection to at least one liquid confectionery supply means,
said outlet being connected to said valve means so that liquid
and iced confectionery may be dispensed simultaneously
10 therefrom.
2. A device according to claim 1 wherein said valve means
is adapted to be connected to a plurality of said liquid
confectionery supply means for receiving different liquid
15 confectionery supplies therefrom.
3. A device according to claim 2 wherein said valve means
comprises a plurality of operational settings each
corresponding to a different liquid confectionery selection
20 to be dispensed.
4. A device according to claim 3 wherein said valve means
comprises a first valve member movable between a plurality of
pre-determined positions each corresponding to an operational
25 setting of the valve means, and a second valve member movable
between an open and a closed position for dispensing the
selected liquid confectionery to said outlet.
5. A device according to claim 4 wherein the first valve
30 member is provided with engagement means for engagement with
the second valve member at each of said pre-determined
positions.
6. A device according to claims 4 or 5 wherein said valve
35 means further comprises a valve inlet and a valve outlet for
each liquid confectionery supply, and said first valve member
is adapted to obturate at least one of said valve inlet or
outlets at each of said pre-determined positions.

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7. A device according to claim 6 wherein said first and second valve members are rotatably mounted within a valve housing.

5 8. A device according to claims 6 or 7 wherein said second valve member comprises a rotatable sleeve having an inlet and outlet aperture for each liquid confectionery supply, the inlet and outlet apertures being arranged to align annularly with corresponding valve inlet and outlets in said open
10 position only.

9. A device according to claim 8 wherein said first valve member comprises a cylindrical end portion rotatably mounted within said sleeve, the cylindrical end portion having a
15 plurality of internal passages for each liquid confectionery supply, each passage being arranged to align annularly with a corresponding sleeve inlet or outlet aperture in at least one of said pre-determined positions.

20 10. A device according to claims 4 to 9 wherein said first and second valve means are manually operable.

11. A device according to any preceding claim wherein said outlet is in the form of a nozzle having a plurality of
25 internal passages which connect to said valve means for receiving liquid confectionery therefrom.

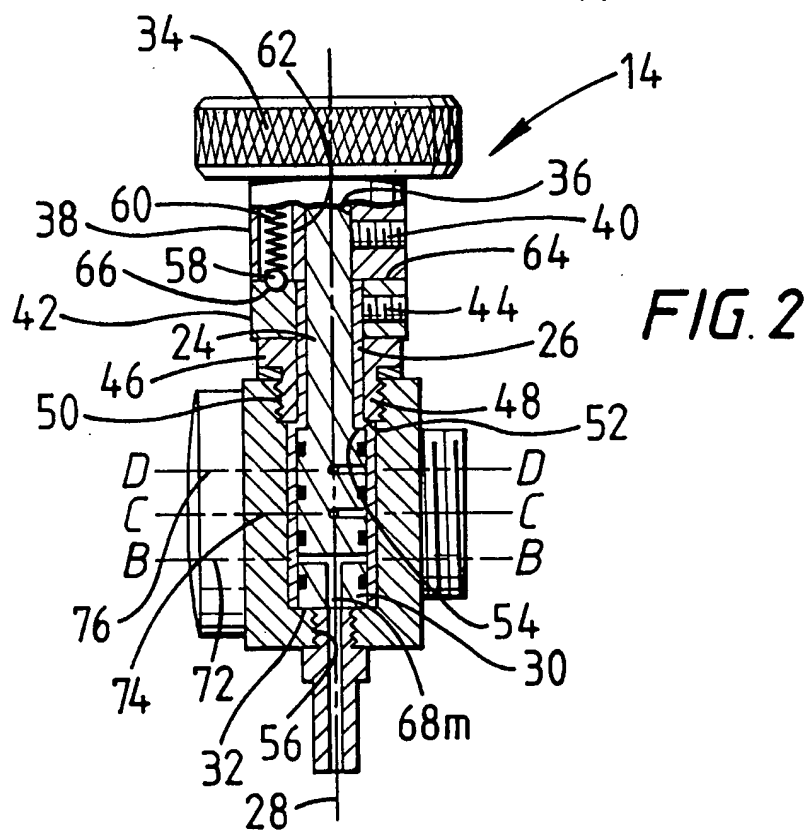
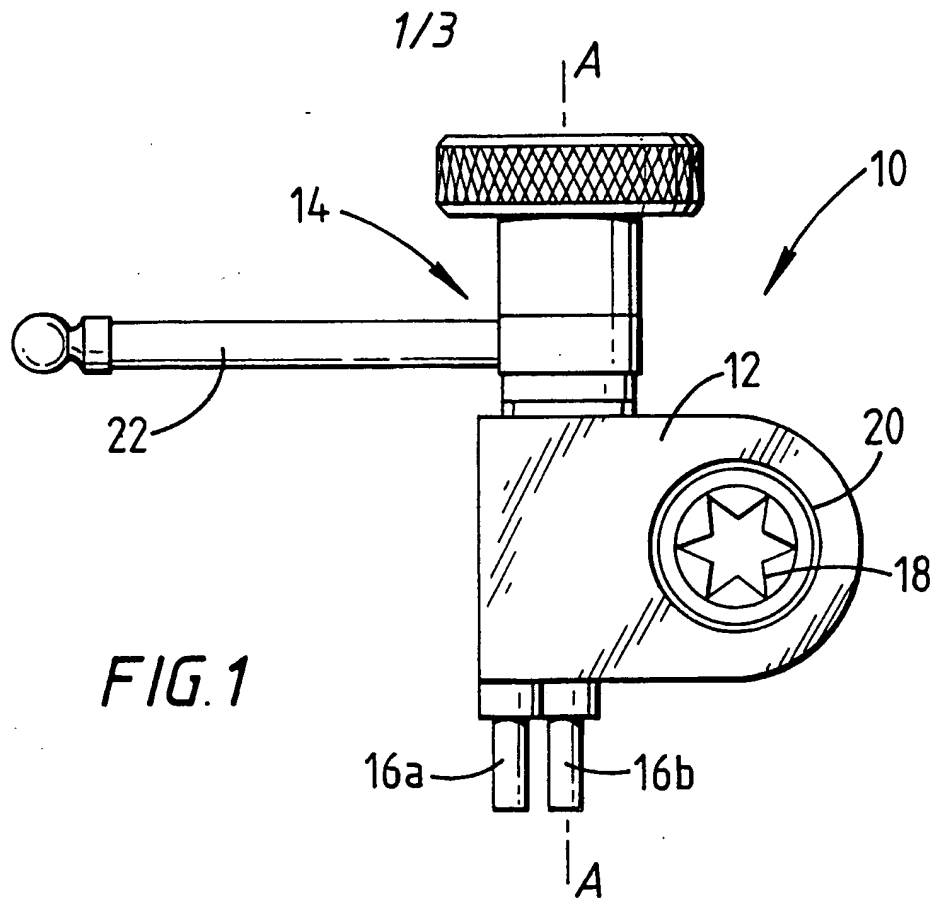
12. A device as claimed in claim 11 wherein said nozzle comprises a central aperture having an entry for receiving
30 iced confectionery and an exit for dispensing iced confectionery, and wherein said internal nozzle passages terminate at the periphery of said nozzle exit so that liquid confectionery may be dispensed on the surface of said iced confectionery.

35

13. A device according to any preceding claim wherein said valve means is adapted to be connected to a dispensing arm of said iced confectionery supply.

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14. A device according to claim 2 or any claim as dependent thereon wherein said valve means is configured to selectively dispense said liquid confectionery from all of said liquid confectionery supply means simultaneously.



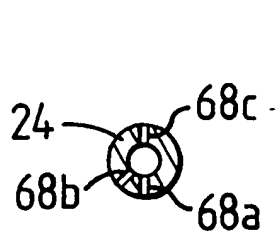


FIG. 3a

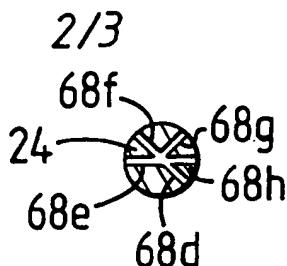


FIG. 3b

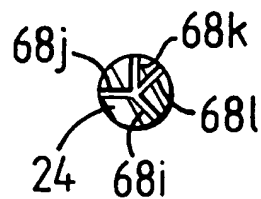


FIG. 3c

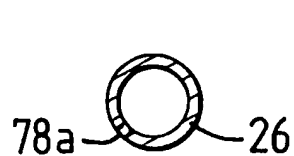


FIG. 4a

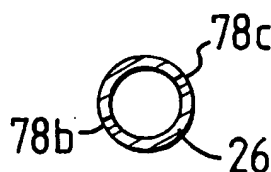


FIG. 4b

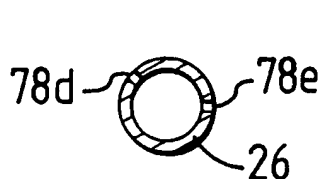


FIG. 4c

FIG. 5a

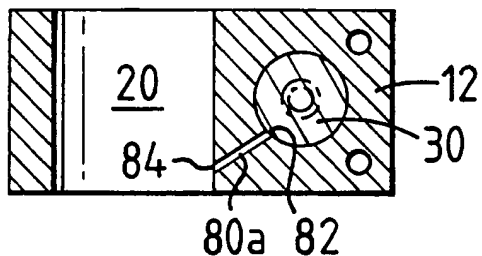


FIG. 5b

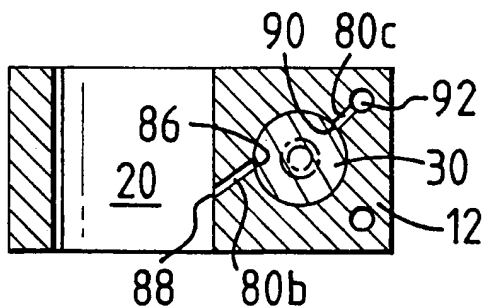
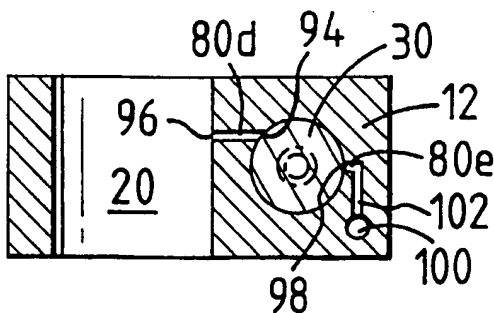


FIG. 5c



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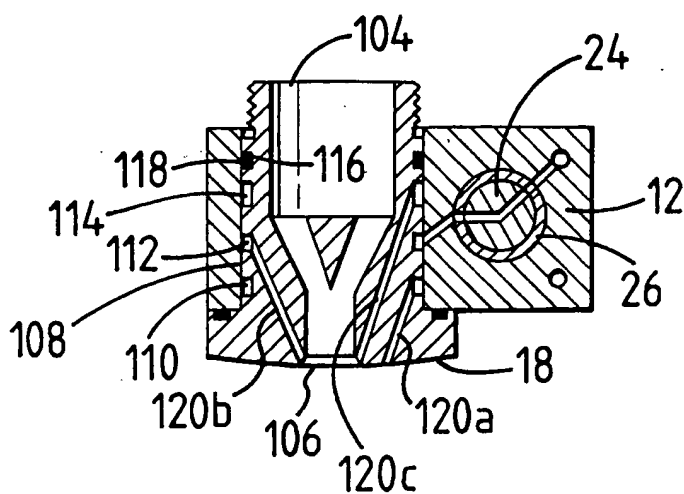


FIG. 6

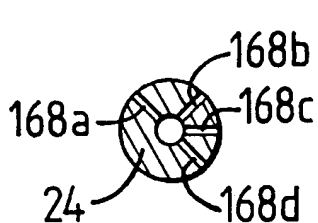


FIG. 7a

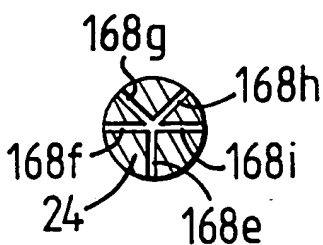


FIG. 7b

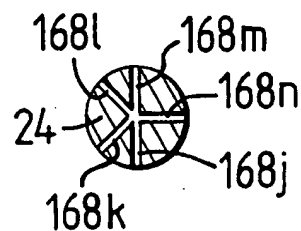


FIG. 7c

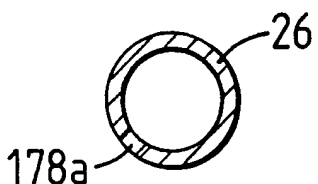


FIG. 8a

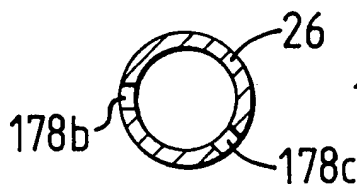


FIG. 8b

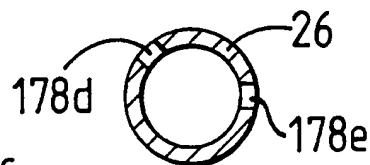


FIG. 8c

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 98/00148

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A23G9/28

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A23G

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NL 285 670 A (MISTER SOFTEE LIMITED) 10 February 1965 see the whole document ---	1-14
X	EP 0 728 417 A (ALI S.P.A. - CARPIGIANI GROUP) 28 August 1996 see claims; figures ---	1-3, 11-14
X	FR 2 223 645 A (SNOW BRAND MILK PRODUCTS) 25 October 1974 see the whole document -----	1-3, 11-14



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

24 April 1998

Date of mailing of the international search report

07/05/1998

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Authorized officer

Lepretre, F

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 98/00148

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